

## COMMUNICATION CONTROL PINS IN A DUAL ROW CONNECTOR

### FIELD

**[0001]** The subject matter described herein relates to connectors and/or cables associated with the Universal Serial Bus (USB).

### BACKGROUND

**[0002]** Physical connectors, such as the connector used with the Universal Serial Bus (USB), can be used to couple devices. USB standards define physical and electrical aspects of USB. Examples of those standards include Universal Serial Bus 3.1 Specification, Universal Serial Bus 3.0 Specification, and any additions, revisions, and updates thereto.

### SUMMARY

**[0003]** Methods and apparatus, including computer program products, are provided for communications control in a dual row connector.

**[0004]** In some example embodiments, there is provided an apparatus. The apparatus may include a first data connector including a pair of communication control pins and another pair of communication control pins, wherein the pair further comprises a first communication control pin located at a first row of the first data connector and a second communication control pin located at a second row of the data connector, wherein the other pair further comprises a third communication control pin located at the first row of the first data connector and a fourth communication control pin located at the second row of the first data connector.

**[0005]** In some variations, one or more of the features disclosed herein including the following features can optionally be included in any feasible combination. The apparatus may further include a second data connector including a first pair of communication control pins and a second pair of communication control pins, wherein the first pair further comprises a fifth communication control pin located at a top row of the second data connector and a sixth communication control pin located at a bottom row of the second data connector, wherein the second pair further comprises a seventh communication control pin located at the top row of the second data connector and an eighth communication control pin located at the bottom row of the second data connector; and a cable including at least one wire coupling the first communication control pin and the fifth communication control pin. The first communication control pin and the second communication control pin may be coupled at the first data connector, and wherein the fifth communication control pin and the sixth communication control pin may be coupled at the second data connector. The first communication control pin and the second communication control pin may be coupled at the first data connector. The first data connector may include a universal serial bus connector.

**[0006]** Moreover, there is provided in some example embodiments an apparatus including a data connector including a first communication control pin and a second communication control pin, wherein the first communication control pin and the second communication control pin are pulled up by at least one pull-up resistor; detection circuitry to detect one communication control pin of the first and the second communication control pins by at least detecting a current flow caused by at least the pull-up when coupled to the data

connector and another device; and communication circuitry coupled to the one communication control pin detected by the detection circuitry and configured to communicate according to a communication protocol.

**[0007]** In some variations, one or more of the features disclosed herein including the following features can optionally be included in any feasible combination. The data connector may include a first row including the first communication control pin and the second communication control pin, and a second row including a third communication control pin and a fourth communication control pin. The apparatus may include at least another pull-up, wherein the other pull-up may be configured to be connected to the one communication pin when detected by the detection circuitry. The other pull-up may include another pull-up resistor comprising a higher resistance than the at least one pull-up resistor. The communication circuitry may be configured to communicate according to another communication protocol, when the detection circuitry detects a current flow both in the first communication control pin and the second communication control pin. The first communication control pin may be coupled to the third communication control pin and wherein the second communication control pin may be coupled to the fourth communication control pin. The first data connector may include a universal serial bus connector.

**[0008]** Furthermore, there is provided in some example embodiments an apparatus including a data connector including a first communication control pin and a second communication control pin, wherein the first communication control pin and the second communication control pin are pulled down by at least one pull-down resistor; detection circuitry configured to detect one communication control pin of the first and the second communication control pins by at least detecting a current flow caused by at least the pull down when coupled to the data connector and another device; and communication circuitry coupled to the one communication control pin detected by the detection circuitry and configured to communicate according to a communication protocol.

**[0009]** In some variations, one or more of the features disclosed herein including the following features can optionally be included in any feasible combination. The data connector may include a first row including the first communication control pin and the second communication control pin, and a second row including a third communication control pin and a fourth communication control pin. The communication circuitry may be configured to communicate according to another communication protocol, when the detection circuitry detects a current flow both in the first communication control pin and the second communication control pin. The first communication control pin may be coupled to the third communication control pin and wherein the second communication control pin may be coupled to the fourth communication control pin.

**[0010]** The above-noted aspects and features may be implemented in systems, apparatus, methods, and/or articles depending on the desired configuration. The details of one or more variations of the subject matter described herein are set forth in the accompanying drawings and the description below. Features and advantages of the subject matter described herein will be apparent from the description and drawings, and from the claims.